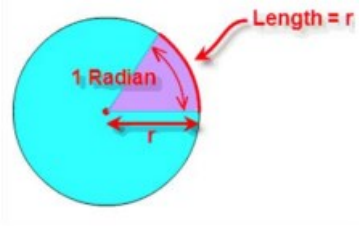
Society of Actuaries in Ireland

Trigonometry 1 – Hints & Tips

- Read the question carefully. θ
- **Draw a diagram every time** and label diagrams.
- Check the mode on your calculator – radians or degrees.
- Check for the format of your answer; e.g. in terms of π.
- Know how & when to round your answer – do not round early.

See Log Tables page 13, 14, 15, 16

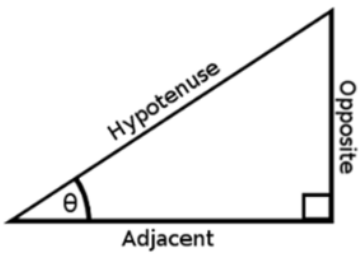


A radian is the measure of the angle at the centre of a circle subtended by an arc equal in length to the radius.

Degrees to radian formulae:	$180^o = \pi$ radians $360^o = 2\pi$ radians
Length of an arc and area within, where θ is the angle in radians:	$l = r\theta$ Area $= \frac{1}{2}r^2\theta$

<u>Right angled triangles</u> page 16 of Tables

Pythagoras Theorem $hyp^2 = opp^2 + adj^2$



$$\text{Sin } x = \frac{Opposite}{Hypotenuse} \quad \text{Cos } x = \frac{Adjacent}{Hypotenuse} \quad Tan\ x = \frac{Opposite}{Adjacent}$$

SOH CAH TOA

Silly **O**ld **H**arry

Caught **A** **H**erring

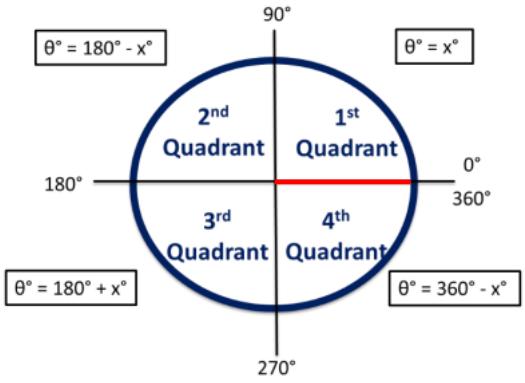
Trawling **O**ff **A**merica

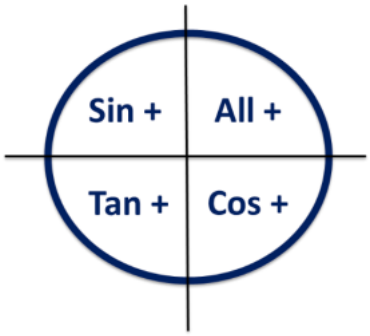
Cosecant, Secant and Cotangent are the reciprocals of these and are given <u>on page 13.</u>

Sin, cos and tan for angles >90 ^{o} page 13 of Tables

Sin, cos and tan have positive or negative signs in different quadrants of a circle.

θ is the angle with the positive x-axis.

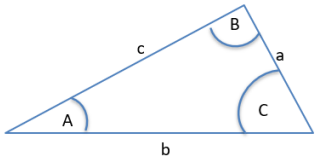




Triangles with no right angle

If there is no right angle, Pythagoras and SOH CAH TOA can't be used – different formulae are used.

- a, b, c are the lengths of the sides
- A, B, C are the angles
- A opposite a
- B opposite b
- C opposite c



Sine rule: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Cosine rule: $a^2 = b^2 + c^2 - 2bcCosA$

Area of triangle: $\frac{1}{2}ab\sin C$

Approach for Triangle questions:

- Start with the simplest formula
- Can Pythagoras be used (is it right angled)?
- Can SOH CAH TOA be used (is it right angled)?
- Can Sine rule be used?
- Can Cosine rule be used?